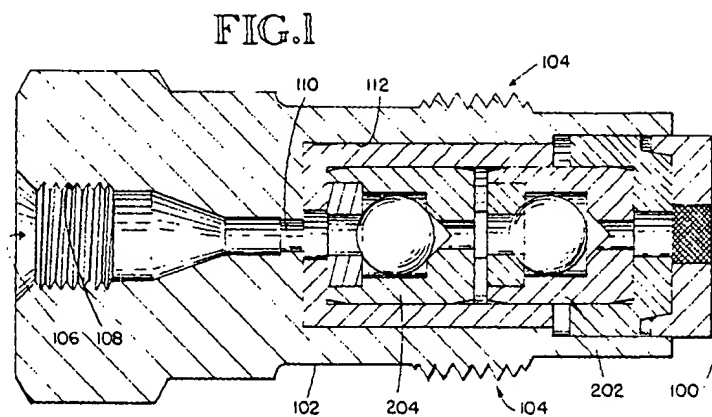


providing pneumatic operation of the micro-valves. Also, a heater is mounted on the manifold plate.



U.S. Patent 4,846,218 (Upchurch)

Upchurch describes a check valve for liquid chromatography pumps. The check valve includes a disposable filter and regulates the flow of a mobilizing liquid in a pump of a liquid chromatograph. The end of the check valve includes an end seal that receives a filter mounted to be removable.

Issues

Are 1-12, 20, 21, and 23-27 properly rejected under 35 U.S.C. § 102(e) as anticipated by *Higdon*?

Are claims 13-17 under 35 U.S.C. § 103(a) as obvious in view of *Higdon* and *Upchurch*?

Is claim 28 allowable?

Arguments

Applicants respectfully submit that the Examiner erred in rejecting claims 1-17, 20-21, and 23-27 because the Examiner has not adequately supported the rejection from knowledge generally available to one of ordinary skill in the art at the time the invention was made, established scientific principles, or legal precedent established by prior case law. *Cf.* MPEP § 2144; *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 21 USPQ2d 1941 (Fed. Cir. 1992); *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Int. 1985). In particular, Applicants respectfully contend that the 35 § 102 rejection is in error because the *Higdon* does not teach what the Examiner asserts it does. Applicants also respectfully contend that the Examiner's 35 § 103 rejection is in error

because *Upchurch* does not teach what the Examiner says it does, and even if the teaching of *Higdon* and *Upchurch* were combined, the combination would not teach the claimed invention.

I. THE REJECTION OF CLAIM 1

The Examiner rejected claim 1 as anticipated under 35 U.S.C. § 102(e) by *Higdon et al.* Applicants respectfully submit that claims 1, 9, and each claim dependent therefrom are in condition for allowance. Claim 1 recites the restriction of sample flow to about 50-70 cc/min. Nowhere is this shown or taught by *Higdon*.

The Examiner states that the reduced tubing size shown in Figure 3A acts as a restrictor. The Examiner then asserts that the restrictions shown in Figure 1 of *Higdon* would be sufficient to restrict the sample flow to "about 50-70 cc/min at 15 psig". Applicants respectfully submit that while, generally speaking, the Examiner's first assertion is true, the Examiner's second assertion is pure speculation and, in fact, can not be supported by the *Higdon* patent.

To anticipate a claim, each and every feature recited in the claim must be included in the device taught by the applied patent. Claim 1 requires that the fluid flow be limited to about 50 to about 70 cc's per minute. A careful perusal of *Higdon* reveals that the patent suggests typical tubing 70 with an internal diameter of 0.01 inches. *Higdon*, col. 4, ll. 22-23. The length of this tubing is not disclosed, however, and therefore the pressure drop across this tubing is unknown. *Higdon* does not explicitly teach the pressure drop across its tubing, and there is no way to determine from *Higdon* to what extent the gas flow will be limited.

Turning to the issue of inherency, to anticipate claim 1, the selector valve of *Higdon* must inherently provide tubing that satisfies the claim limitation. To inherently teach a feature, the feature must *necessarily* be present in the allegedly anticipatory device. Possibilities and probabilities are not enough. *See Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

The *Higdon* patent does not necessarily teach that its tubing will restrict the sample flow to about 50-70 cc/min. Without knowledge of the length of the tubing of *Higdon*, it cannot be said that any particular restriction will necessarily be achieved. Thus, claim 1 is not anticipated or made obvious by *Higdon*. Applicants respectfully request allowance of claim 1.

II. THE REJECTION OF CLAIM 9

Claim 9 recites fluid flow actuation switches associated with the actuatable ports, the fluid flow actuation switches controlling the placement of the actuatable ports between open and closed

positions, the fluid flow actuation switches requiring an outside impulse to place the actuatable ports in said open position. Applicants note with appreciation the Examiner's effort in observing that the recitation of claim 9 may be inconsistent with the argument presented in Applicant's response dated August 9, 2001. In particular, the Examiner notes on pages 3-4 of the office action that "With regard to claim 9 remarks, claim 9 includes recitation that an 'outside impulse (is required) to place said actuatable ports in the open position'. This recitation appears to be contrary to '...this forces the pistons into an upward position, resulting in closed ports' remarks in the amendment..." However, Applicants respectfully submit that the Examiner is mistaken.

Referring now to Figure 7, a series of solenoids 750-757 are shown. Actuation pressure line 758 is also shown. Constant pressure is supplied along actuation pressure line 758. With the use of prior art solenoids, power must be applied to the solenoids to shut off the pressure from line 758. In contrast, as disclosed at page 20 of the instant application, the preferred embodiment employs solenoids that are open when power is not applied, and hence allow the flow of actuation pressure when power is not applied. This is important in the context of the invention because upon the application of actuation pressure, the inlet and outlet ports to the common stream channel close (see, e.g., Figure 5), preventing leakage of sample upon power failure. Thus, when power is not applied the actuatable port. Conversely, when power is applied, the solenoid is closed (preventing pressure from the actuation gas) so that the actuatable port is open, allowing the flow of fluid. It should be noted that, despite the fact that pistons are shown in Figure 5, the pistons themselves are not required for the use of solenoids in a default open position to be useful. As shown by *Higdon*, actuation ports may be constructed without the use of pistons.

Because *Higdon* does not teach fluid flow actuation switches requiring an outside impulse to place the actuatable ports in an open position, *Higdon* does not anticipate claim 9. Allowance of claim 9 is respectfully sought.

III. THE REJECTION OF CLAIM 13

Claims 13-17 were rejected under 35 U.S.C. § 103 as obvious in view of *Higdon* and *Upchurch*. In particular, the Examiner stated that "*Higdon* discloses the claimed invention except for the recitation of a 'filter' as taught by *Upchurch* (Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the chromatograph system of *Higdon et al* to include a 'cartridge filter' as taught by *Upchurch* in order to provide more 'pure' fluid to be tested and/or processed." OA of 11/5/01, p. 5. "Further in particular not the

disclosure of a filter for the 'fluid streams' (column 6, lines 58+) of *Higdon et al.* Applicant's remarks, drawn to filter disposition, were considered, however, not deemed persuasive. In column 6, lines 58+ both outlet port filters and filters disposed in inlets are disclosed." *Id.*

Applicants respectfully submit that the Examiner is mistaken. *Upchurch* teaches a check valve for liquid chromatography pumps. Included in this check valve is a clean filter 226 (col. 4, l. 28). However, this alone does not render the invention of claim 13 unpatentable.

Claim 13 requires a sample point, a stream switching portion, tubing connecting the two, and one or more membrane or cartridge filters connected to the tubing and located proximate the sample point between the sample point and the stream switching location. Claim 14 specifies that the membrane or cartridge filters are within 10 feet of the sample point. Claim 15 specifies that the membrane or cartridge filters are within 3 feet of the sample point. As explained in the instant specification at p. 14, ll. 10-19, the placement of a filter as close as feasible to the sample point is advantageous. For example, the closer the filter is to the sample point, the lower the pressure needed in the overall system to force the sample through the filter. In addition, placement of the filter closer to the sample point, and the accompanying lower pressure necessary to operate the system, results in a longer life filter. Further, placement of the filter outside the stream switching system simplifies replacement and maintenance.

Applicants readily admit that filters are old in the art, and the mere inclusion of a filter in a gas chromatograph system is not what makes the claim patentable. Claim 13 recites not simply a filter, but one or more filters proximate the sample point and between the sample point location and the stream switching portion. Claim 14 specifies that the filter(s) are within 10 feet of the sample point. Claim 15 requires that the filter(s) be within 3 feet of the sample point. Claims 16 and 17 specify the location of a pressure regulation device with respect to the filter. *Upchurch* fails to teach or suggest a location for the filter. Even more damaging, *Upchurch* fails to teach or suggest that the filter should be proximate the sample point, should be within 10 feet of the sample point, or should be within 3 feet of the sample point. Applicants respectfully submit that the Examiner has failed to make a *prima facie* case of obviousness and therefore requests allowance of the claims.

Thus, even if *Higdon* and *Upchurch* were combined, there is no suggestion in either patent to place a filter at the recited location of claim 13 and claims dependent therefrom. Allowance of claim 13 is respectfully requested.

IV. NEW CLAIMS 28-30

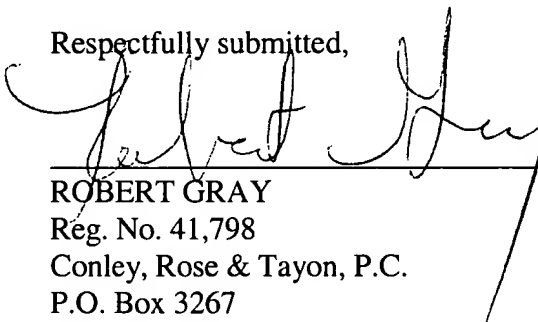
New claim 28 recites a stream switching system having a housing, tubing, insulation around the housing and tubing, and a heater to warm the housing and tubing to a predetermined temperature, where the tubing acts as a flow restrictor to heat a fluid sample having a liquid portion to a predetermined temperature. As disclosed at page 16 of the specification, this flow restriction and subsequent heating of the fluid sample ensures that it enters a gas chromatograph in the gaseous phase. Claim 29 specifies that this temperature is about 80 degrees. Claim 30 requires that the predetermined temperature be approximately the same as the gas chromatograph temperature.

This heating of the sample accomplishes two goals. First, the sample must preferably be introduced to the gas chromatograph as a single phase sample instead of a two-phase liquid/gas sample. Temperatures above about 80 degrees Fahrenheit are normally adequate to maintain a gaseous sample of most hydrocarbon process streams at a sample pressure of 15-25 psi. Second, an elevated temperature (preferably near the chromatograph temperature) for the sample is desirable for the optimal operation of the gas chromatograph. Thus, the "pre-heating" of the sample helps to achieve a more accurate measurement of the sample's composition by the gas chromatograph.

V. CONCLUSION

Applicants respectfully request reconsideration and allowance of all the claims.

Respectfully submitted,



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MARKED-UP VERSION OF AMENDMENTS

In the Claims:

1. (Amended) A stream switching system, comprising:
 - a stream switching housing having at least one common stream channel portion with a plurality of input ports and at least one output port;
 - tubing connected at least one of said output ports,
 - said tubing at least in part being a pre-heat coil suitable to heat a [gas] fluid sample traveling through said coil and to act as a flow restrictor for flow restriction of said fluid sample, the extent of said flow restriction sufficient to restrict said sample flow to about 50-70 cc/min [at 15 psig].